

Appl. No. 09/936,463
Amdt. dated September 14, 2005
Reply to Office action of July 26, 2005

In the Claims:

Claims 8, 11, 14 and 17 are newly canceled herein. Claims 10, 13, 16 and 19 are allowed. Claims 1-7 were previously canceled.

1. (canceled)

2. (canceled)

3. (canceled)

4. (canceled)

5. (canceled)

6. (canceled)

7. (canceled)

8. (canceled)

9. (canceled)

10. (previously presented) A power saving control method for use on a computer system, comprising the steps of:

checking, when there is no executable user task and therefore a CPU has entered an idle state, if any timer-expiration-waiting event is present in an event queue, which manages event-waiting tasks;

Appl. No. 09/936,463
Amdt. dated September 14, 2005
Reply to Office action of July 26, 2005.

switching the computer system to a first power saving operation mode when there is any timer-expiration-waiting event in the event queue, said first power saving operation mode stopping a CPU operation clock while allowing a timer interrupt to be accepted;

switching the computer system to a second power saving operation mode when there is no timer-expiration-waiting event in the event queue, said second power saving operation mode inhibiting the timer interrupt while stopping the CPU operation clock;

saving the time of a hardware timer when entering the second power saving operation mode;

returning the computer system from the first or the second power saving operation mode to a normal operation mode in response to an occurrence of an interrupt; and

detecting the time of the hardware timer when the computer system returns from the second power saving operation mode to the normal operation mode, calculating an elapsed time from the saved time, and correcting a timer value of a software timer based on the elapsed time.

11. (canceled)

12. (canceled).

Appl. No. 09/936,463
Amdt. dated September 14, 2005
Reply to Office action of July 26, 2005

13. (previously presented) A computer system comprising a CPU having a real-time operating system, wherein said real-time operating system comprises:

an execution queue that manages a queue of execution waiting tasks;

an event queue that manages event waiting tasks; and

a power saving transition check module that checks if there is any timer-expiration-waiting event in the event queue when there is no executable user task in the execution queue and therefore a CPU has entered an idle state and, depending upon whether or not there is any timer-expiration-waiting event in the event queue, switches the computer system from a normal operation mode to a first power saving operation mode or to a second power saving operation mode that has a power saving effect different from that of the first power saving operation mode, and

a power saving mode release module that returns the computer system from the first or the second power saving operation mode to the normal operation mode according to a predetermined return condition,

wherein, when there is no executable user task and therefore the CPU has entered the idle state, said power saving transition check module switches the computer system to the first power saving operation mode when there is any timer-expiration-waiting event in the event queue, said first power saving operation mode stopping a CPU operation clock while allowing a timer interrupt

Page 4 -- RESPONSE (U.S. Patent Appln. S.N. 09/936,463)
[\\Files\files\Correspondence\September 2005\y187rtoa091405.doc]

Appl. No. 09/936,463
Amdt. dated September 14, 2005
Reply to Office action of July 26, 2005

to be accepted, switches the computer system to the second power saving operation mode when there is no timer-expiration-waiting event in the event queue, said second power saving operation mode inhibiting the timer interrupt while stopping the CPU operation clock and, at the same time saves the time of a hardware timer, and wherein said power saving mode release module returns the computer system from the first or the second power saving operation mode to the normal operation mode in response to an occurrence of an interrupt, detects the time of the hardware timer, calculates an elapsed time from the saved time, and corrects a timer value of a software timer based on the elapsed time.

14. (canceled)

15. (canceled)

16. (previously presented) A recording medium storing therein a computer readable program executing the steps of:

checking, when there is no executable user task and therefore a CPU has entered an idle state, if any timer-expiration-waiting event is present in an event queue, which manages event-waiting tasks;

switching the computer system to a first power saving operation mode when there is any timer-expiration-waiting event in the event queue, said first power saving operation mode

Appl. No. 09/936,463
Amdt. dated September 14, 2005
Reply to Office action of July 26, 2005

stopping a CPU operation clock while allowing a timer interrupt to be accepted;

switching the computer system to a second power saving operation mode when there is no timer-expiration-waiting event in the event queue, said second power saving operation mode inhibiting the timer interrupt while stopping the CPU operation clock;

saving the time of a hardware timer when entering the second power saving operation mode;

returning a computer system from the first or the second power saving operation mode to a normal operation mode in response to an occurrence of an interrupt; and

detecting the time of the hardware timer, when the computer system returns from the second power saving operation mode to the normal operation mode, calculate an elapsed time from the saved time, and correct a timer value of a software timer based on the elapsed time.

17 (canceled)

18. (canceled)

19. (currently amended) A microprocessor having a function of a real-time operating system, wherein said real-time operating system comprises:

an execution queue that manages a queue of execution waiting tasks;

Appl. No. 09/936,463
Amdt. dated September 14, 2005
Reply to Office action of July 26, 2005

an event queue that manages event waiting tasks;

a power saving transition check module that checks, when there is no executable user task in the execution queue and therefore a CPU has entered an idle state, if there is any timer-expiration-waiting event in the event queue and, depending upon whether or not there is any timer-expiration-waiting event in the event queue, switches the microprocessor from a normal operation mode to a first power saving operation mode or to a second power saving operation mode that has a power saving effect different from that of the first power saving operation mode; and

a power saving mode release module that returns the computer system from the first or the second power saving operation mode to the normal operation mode according to a predetermined return condition;

wherein when there is no executable user task and therefore the CPU has entered the idle state, said power saving transition check module switches the computer system to the first power saving operation mode when there is any timer-expiration-waiting event in the event queue, said first power saving operation mode stopping a CPU operation clock while allowing a timer interrupt to be accepted, switches the computer system to the second power saving operation mode when there is no timer-expiration-waiting event in the event queue, said second power saving operation mode inhibiting the timer interrupt while stopping the CPU operation clock and, at the same time saves the time of a hardware timer,

Page 7 — RESPONSE (U.S. Patent Appln. S.N. 09/936,463)
[\\Files\files\Correspondence\September 2005\y187rtoa091405.doc]

Appl. No. 09/936,463
Amdt. dated September 14, 2005
Reply to Office action of July 26, 2005

and wherein said power saving mode release module returns the computer system from the first or the second power saving operation mode to the normal operation mode in response to an occurrence of an interrupt, detects the time of the hardware timer, calculates an elapsed time from the saved time, and corrects a timer value of a software timer based on the elapsed time.

20. (canceled)

21. (canceled)

22. (canceled)